Luis Enrique Selva, Ph.D.
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Education

University of California, Los Angeles (UCLA) **Los Angeles, CA**
Ph.D. in Biomedical Physics, June 2008
Advisor: Usha Sinha, Ph.D.
Thesis: Quantitative multivariate analysis of human brain structures in vivo using magnetic resonance imaging at 3.0 Tesla
Master of Science in Biomedical Physics September 2005
Emphasis: Radiation oncology and Medical Imaging

California State University Los Angeles (CSULA) **Los Angeles, CA**
Master of Science in Physics, September 2001
Advisor: William Taylor, Ph.D.
Thesis: The study of the Single-Event Gate Rupture phenomenon in power MOSFETs (Metal Oxide Semiconductor Field Effect Transistors).

- **University of Southern California (USC)** **Los Angeles, CA**
  Bachelor of Science in Mechanical Engineering, May 1995.

Academic Awards and Honors

National Library of Medicine (NLM) Pre-doctoral Fellow (2003 - 2007)
Eugene Cota Robles scholar (UCLA) (1999 - 2003)
Alumni Certificate of Honor for "outstanding and distinguished academic achievement"(CSULA) (2000)
Nominated to the Hispanic Engineering National Achievement Awards Conference (HENAAC) from JPL in the category of "most promising Scientist/Engineer" (2000)
First place winner of the 12th annual statewide graduate research competition for the California State University (CSU) system. Title of presentation "Ion Induced Electric Field Transient… the Single-Event Gate Rupture (SEGR)" (1998)
Recipient of JPL's "Award for Excellence" as a team member of the Radiation Test group (1998)
Graduate Honor Student (CSULA) (1997-1998)
Winner of the 6th annual CSULA graduate student research competition in the category of physics, chemistry and engineering (1998)
"Process Improvement Award" as a team member of JPL's Radiation Test group (1998)
Finalist at the 11th annual statewide graduate research competition for the California State University system. Title of presentation "Total dose response of the ACTEL A1020B" (1997)
First place winner of the 5th annual CSULA graduate student research competition in the category of physics, chemistry, and engineering (1997)
Mexican American Alumni Association Scholarship (USC) (1986 – 1990)
Norman Topping Scholar (Scholarship program) (USC) (1985 – 1990)

Skills & Expertise

Radiation dosimetry, health physics, image processing, quantitative T1, T2, ADC, FA and MT Magnetic Resonance imaging, parametric atlas creation and statistical analysis using Principal component analysis
Computer: MatLab, IDL, ImageJ, MCNP, MCNPX, SRIM/TRIM, JAVA, and some FORTRAN
Operating Systems: Mac, PC, and some Unix
Fluent in English, Spanish and American Sign Language

RESEARCH EXPERIENCE

June ’96 –Present

Jet Propulsion Laboratory (JPL), supervisor: Steven McClure
Staff Engineer: Assist in the design and development of hardware and testing approaches for irradiation of microelectronic devices for total ionizing dose (TID) and heavy ion irradiation; perform radiation test on-site and off-site at high-energy particle accelerators, i.e., Brookhaven National Laboratory (BNL), Texas A&M University, University of Indiana at Bloomington, UC Davis, and UC Berkeley. Investigate microdosimetry issues related to power MOSFETs using Monte Carlo transport codes, i.e., MCNP, MCNPX, and TRIM/SRIM. Analyze results and write reports describing conclusions. Designed several coldfingers that utilized liquid nitrogen (close and open loop systems) for cryogenic irradiation of microelectronic devices for use at JPL and at BNL.

July ’02 –June ‘08

Medical Imaging Informatics (MII) UCLA, advisor: Dr. Usha Sinha
Developed and optimized magnetic resonance protocols to acquired MRI data in order to produce high-resolution parametric maps and probabilistic atlases of human brains using Diffusion Tensor Imaging (DTI), Magnetization Transfer Contrast (MTC), and Relaxometry at 1.5 and 3.0 Tesla within a feasible scan time of 30 minutes. Wrote code to extract translational invariant MRI parameters, e.g., Magnetization Transfer Ratio (MTR), fractional anisotropy (FA), apparent diffusion coefficient (ADC), T1 (longitudinal relaxation), T1sat (T1 measured with a RF pulse to saturate macromolecules with short T2), and Kf (forward magnetization rate) from the acquired MRI data. Created two separate automated systems to performed image processing. The first one established a pipeline between a PAC system and a dedicated workstation and was designed to perform Diffusion Tensor Analysis, i.e., ADC, FA maps and connectivity maps (color coded). The output of the automated system was DICOM compliant and could be integrated into the PACS along side the original patient data. The second automated system processed acquired 3D Spoiled Gradient Recall (SPGR) data and extracted T1 and T2 maps from a set of SPGR sequences. Probabilistic atlases of subjects with similar characteristics (e.g., age, gender, normal) were created from the parametric maps. The atlases were studied for variations in population cohort using Principal Component Analysis (PCA).

March –June ’96

California State University Los Angeles (CSULA), supervisor: Dr. K. Aniol,
Physics Department: designed and implemented radiation experiments to test the radiation hardiness of commercial of the shelf (COTS) microelectronics devices. Devices were irradiated with the department’s 4 MeV Van de Graaff accelerator. Designed a test chamber/transport vessel for irradiating of oxygen sensitive materials.

January ’87 – August ’95

University of Southern California (USC), supervisor: Dr. C. E. Synolakis,
Civil Engineering Department: assisted a Ph.D. candidate in the data acquisition, design, and construction of a water channel (tank) in which fluid dynamics experiments for a doctoral thesis were performed. The experiments were designed to study the hydrodynamic forces experienced by an accelerating wall .

Other experience (Leadership experience)

September ’95 – February ’96

Assesor legal: Consulado de El Salvador en Santa Ana, supervisor: Ana Morot-Gaudry, Consul General

Assisted citizens of El Salvador with the filling of documents for obtaining legal status in the United States under the American Baptist Church (**ABC**) program.

February ’90 – November ’93

Project Supervisor: Cedars Sinai Medical Center, supervisor: Anthony Hernandez,
Supervised the day-to-day activities of 30 employees in the department of Plant Operation and Maintenance.

PUBLICATIONS AND ORAL PRESENTATIONS

1. Leif Scheick, Member, IEEE, **Luis Selva**, Larry Edmonds; "Effect of dose history on SEE properties of power MOSFETS", IEEE, TNS, vol. 54, no. 6, pp. 2568-2575, December 2007.
2. **Luis E. Selva**, et al., "Effects of radiation on commercial power devices", poster presentation at the IEEE nuclear space radiation effects conference (NSREC) data workshop, July 2006.
3. Leif Scheick, Larry Edmonds, **Luis E. Selva**, et al., "Current leakage evolution in partially gate ruptured power MOSFETs", presented as an oral paper to the nuclear space radiation effects conference (NSREC), July, 2006.
4. S. Ardekani, **L. Selva**, J. Sayer U. Sinha, "Quantitative Metrics for Evaluating Parallel Acquisition Techniques in Diffusion Tensor Imaging at 3T", Investigative Radiology. 41(11): 806-814, November 2006.
5. **Luis E. Selva**, et al., "Automated Processing of Diffusion Tensor Data for Integration Within a PAC System," Poster presentation at the Radiological Society of North America (RSNA) 2004.
6. **Luis E. Selva**, et al., "Automated Processing of Diffusion Tensor Data for Integration Within a PAC System," Poster presentation at the Biomedical Physics student colloquium 2005.
7. **Luis E. Selva**, et al., "Automated Processing of Diffusion Tensor Data for Integration Within a PAC System," Presented at the 2004 International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences (METMBS '04).
8. **Luis E. Selva**, el al., "Automated Decision Support for Brain MRI Protocol Selection," Presented at the 2004 International Conference on Mathematics and Engineering Techniques in Medicine and Biological Sciences (METMBS '04).
9. **Luis E. Selva**, "Automated Processing of Diffusion Tensor Data for Integration Within a PAC System," presented to the National Library of Medicine Conference, Indiana 2004.
10. **Luis E. Selva** and Leif Z. Scheick, "Cold Temperature SEE Experiments on Advance MOS Technology," presented at the *IEEE Trans. On Nuc. Sci.* conference, 2002 (to appear in December 2002 conference proceedings).
11. **Luis. E. Selva** and Leif Z. Scheick, " Experimental Techniques for SEE Test at Low Temperatures," 2002, presented and published in the Single-Event Effects Thirteenth Symposium Proceedings (to appear in December 2002).
12. **L. E. Selva**, R. E. Wallace, R. Alanis, K. H. Chin, "Ion Track Structure Model and the Transient Electric Field," presented at the Nuclear Instruments and Methods in Physics Research B 2001.
13. **L. E. Selva**, G. M. Swift, "Catastrophic Heavy-Ion Failure of a Commercial ASIC," 2000, presented and published in the Single-Event Effects Twelfth Symposium Proceedings.
14. J. R. Coss, G. M. Swift, **L. E. Selva**, "Device SEE Susceptibility Update: 1996-1998", 1999, IEEE Nuclear and Space Radiation Effect Conference (Data Workshop paper).
15. A. H. Johnston, B. G. Rax, **L. E. Selva**, and C. E. Barnes, "Proton Degradation of Light-Emitting Diodes", 1999, *IEEE Trans. on Nuclear Science*, vol. 46, no. 6, pp. 1781 - 1789.
16. **L. E. Selva**, G. M. Swift, W. A. Taylor, and L. D. Edmonds, "On The Role of Energy Deposition in Triggering SEGR in Power MOSFETs", 1999, *IEEE Trans. on Nuclear Science*, vol. 46, no. 6, pp. 1403 - 1409.
17. J. R. Coss, G. M. Swift, **L. E. Selva**, J. L. Titus, E. Norman, D. L. Oberg, "Compendium of Single-Event Failures in Power MOSFETs", 1998, IEEE Nuclear and Space Radiation Effects Conference (Data Workshop paper).
18. **L. E. Selva**, "Ion Induced Electric Field Transient…the Single-Event Gate Rupture", 1998, presented at the 1998 California State University finals in the category of graduate student research competition, held at California State University Chico.
19. **L. E. Selva**, G. M. Swift, William A. Taylor, L. D. Edmonds, "Observations on the Presumed LET Dependence of SEGR", 1998, presented and published in the Single-Event Effects Eleventh Symposium Proceedings.

20. G. M. Swift, L. D. Edmonds, **L. E. Selva** and A. H. Johnston, "Investigations into the Power MOSFET SEGR Phenomenon and its Physical Mechanisms", 1997, IEEE Nuclear and Space Radiation Effects Conference (Presented in July).
21. **Luis E. Selva**, "Total dose response of the ACTEL A1020B', presented at the 1997 California State University finals in the category of graduate student research competition, held at California Polytechnic State University San Luis Obispo.
22. R. C. Lacoe, S. C. Moss, D. C. Mayer, B. K. Janousek, S. C. Wictzak, S. D. LaLumondiere, S. Brown, K. Aniol, B. Magness, and **L. Selva**, "Neutron and Proton Irradiation for Latchup Suppression in CMOS Commercial Microelectronics', 1996, To be published.
23. C. Barnes and **L. Selva**, "Radiation Effects in MMIC Devices": chapter 10 of "GaAs MMIC Reliability Assurance Guideline for Space Applications", edited by S. Kayali, G. Ponchak, and R. Shaw, JPL Publication 96-25, Pasadena, California (December 1996).
24. C. Barnes and **L. Selva**, "Radiation Effects Review: GaAs MMIC Devices and Circuits" Report No. JPL D-13972, NASA, Pasadena, California (September 1996).

CONFERENCE EXPERIENCE

Poster Session Chair for the 2000 IEEE Microelectronics Reliability and Qualification Workshop (MRQW) sponsored by JPL and held in Glendale, California.

RERENCES UPON REQUEST